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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,702	05/03/2005	Harold A Goldsberry III	CH-756/MD02-94	7830

23413 7590 10/05/2009  
CANTOR COLBURN, LLP  
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Hartford, CT 06103

EXAMINER
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CORDRAY, DENNIS R

ART UNIT	PAPER NUMBER
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1791

NOTIFICATION DATE	DELIVERY MODE
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10/05/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/533,702	GOLDSBERRY ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	DENNIS CORDRAY	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2009 and 15 September 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☐ Claim(s) 16 and 35-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16, 35-40 and 43-45 is/are rejected.
- 7) ☒ Claim(s) 41 and 42 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/15/2009</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's abandonment of the cited copending applications has overcome the Double Patenting rejections. Applicant's cancellation of all claims except for Claim 16, which has been amended, has overcome all outstanding rejections over prior art as written. Therefore, the rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made as detailed herein.

Applicant's arguments with regard to Frolich et al, see pp 6-8 are convincing. The reference fails to indicate the starches as claimed in amended Claim 16.

Regarding Conner et al, the reference teaches making sizing compositions comprising ASA, a dispersant and stabilizer in water. The stabilizer can be an oxidized or ethylated starch. In an example (Example 3) a modified corn starch is mixed with the dispersant and sizing agent to form the emulsion, thus the emulsion can be formed as claimed. In some embodiments, an additional ionic starch (second starch) is added to change the charge level. One of ordinary skill in the art would have found it obvious to add the second starch after forming the emulsion as a functionally equivalent option.

Applicant's citations of Examples 2 and 6 reflect another embodiment of Conner et al, in which a sizing dispersion is added to an oxidized starch. However, in Example 3, the starch is incorporated during the formation of the emulsion or, at least, such incorporation would have been obvious to one of ordinary skill in the art.

***Claim Rejections - 35 USC § 102 and 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 16, 35, 40 and 43-45 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Conner et al (6183550).

Claim 16, 35 and 40: Conner et al discloses a method of making a sizing composition comprising emulsifying a sizing agent such as alkenyl succinic anhydride (ASA), a dispersant and a starch stabilizer (first starch component) in water. The stabilizer can be nonionic or anionic, e.g. oxidized or ethylated starch, pearl starch. Corn starch is exemplified (Abs; col 2, line 39-41; col 4, line 61 to col 5, line 23; col 9, lines 25-29; col 11, lines 17-43, Example 1; col 12, lines 13-20, Example 3). In some embodiments, a cationic starch (second starch component) may be added to increase the cationic charge level of the dispersion. In other embodiments, an anionic starch (second starch component) may be added to increase the anionic charge level of the dispersion (col 9, line 64 to col 10, line 9). Alternatively, Example 4 discloses using the already formed dispersions of Example 3 to surface size paper according to the procedures of Example 2, in which the sizing emulsion is added to additional starch (obviously either nonionic or ionic) prior to sizing paper (cols 11 and 12), thus an emulsion formed using ASA and a starch is combined with a second starch prior to sizing paper.

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The compositions provide improved sizing to paper (fibrous substrate) over a commercially available sizing composition (col 12, lines 50-51, Example 4), thus have the claimed starch:ASA ratio to impart useful sizing properties or, at least the claimed ration would have been obvious to one of ordinary skill in the art.

Claim 43: In the emulsions, the sizing agent is present in an amount from about 1 to about 50% on a dry basis based on the total weight of the dispersion (col 9, lines 11-14); the surfactant is present in an amount from 0.0001% to 20% based on the total weight of the dispersion (col 9, lines 14-21) and the starch is present in an amount up to about 20% on a dry basis based on the total weight of the dispersion (col 9, lines 35-38). The disclosed ranges provide ratios of first starch to sizing agent that overlap the claimed ratios.

Claim 44: In Example 4, a 5% solution of second starch was added in an amount to bring the sizing agent concentration to 0.125%, thus the ratio of total starch to sizing agent is approximately 5:0.125 or 40:1.

Claim 45: In Example 3, the first starch is added in a 20% solution in water.

Claims 16, 39 and 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dauplaise et al (6210475) in view of Pardikes (5653915).

Claims 16 and 39: Dauplaise et al discloses a method of making a paper sizing emulsion comprising emulsifying water, ASA and a pumpable and partially degraded cationic hydroxyalkylated, preferably hydroxyethylated or hydroxypropylated, starch (first starch component) and sizing a paper (Abs; col 1, lines 6-14; col 2, lines 54-57; col

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3, lines 5-8 and 25-28; col 4, lines 46-47). Suitable starches are potato starch, corn starch, tapioca starch, wheat starch, etc. (col 4, lines 51-60), which are modified to contain hydroxyalkyl and cationic groups, thus is the product of modifying a starch by hydroxyalkylation. The disclosure that a paper is sized implicitly discloses that the ratio of starch:ASA is sufficiently high to enable the composition to impart useful sizing properties to the paper or, at least, such ratio and sizing properties would have been obvious to one of ordinary skill.

Dauplaise et al does not disclose combining the emulsion with a second starch.

Pardikes teaches that the commercial preparation of an ASA emulsion for sizing paper involves emulsifying water, starch (first starch component), ASA and a surfactant under a high degree of shear in a ratio of starch:ASA of approximately 8:1, then further diluting downstream with additional starch addition (second starch component) to a ratio of approximately 30:1 (col 2, line 43 to col 3, line 7). Pardikes discloses a variation of the method of forming the starch/ASA emulsion and of further mixing in a second starch component that provides a particle size in the sub-micron range, improves on the sensitivity of the process to emulsifier flow rate variation and viscosity change, and does not subject the emulsifier to a damaging high pressure drop. The disclosed method still comprises forming an emulsion having a ratio of starch:ASA of approximately 8:1, then further diluting downstream with additional starch addition to a ratio of approximately 30:1 (Abs; col 1, lines 4-22; col 6, line 7 to col 7, line 11, Fig. 1).

Pardikes discloses that ASA emulsions are stabilized by cationic starches (col 1, line 36), but does not disclose the claimed modification products.

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The art of Duplaise et al, Pardikes and the instant invention is analogous as pertaining to making sizing compositions for paper. It would have been obvious to one of ordinary skill in the art to emulsify a first starch component and ASA and to combine the emulsion with a second starch component in the process of Duplaise et al in view of Pardikes to obtain the advantages disclosed by Pardikes.

Claims 43 and 44: Duplaise et al discloses a starch:ASA ratio of up to 10:1 in the emulsion (col 4, lines 64-66). The starch:ASA ratios disclosed by Duplaise et al and Pardikes overlay the claimed ratios.

Claim 45: Duplaise et al discloses the solids content of the first starch solution is up to 30%, which overlays the claimed range (col 2, lines 57-611). Pardikes discloses that a starch and water solution of 3-4% is used commercially (col 2, lines 48-49).

Claims 16, 35, 36, 38, 40 and 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pandian et al (5472485) in view of Pardikes.

Claims 16, 35, 36, 38 and 40: Pandian et al discloses a method of making a paper sizing composition comprising emulsifying water, ASA, a starch (first starch component) and a zirconium salt. Suitable starches are potato starch, corn starch, tapioca starch, etc. The starches can be modified by acid treatment, acetylation, oxidation, etc., thus are the claimed modification products. The composition provides useful sizing properties to paper thus the ratio of starch:ASA is sufficiently high to enable the composition to impart useful sizing properties to the paper or, at least, such

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ratio and sizing properties would have been obvious to one of ordinary skill. (Abs; col 2, lines 55-59; col 3, lines 11-19 and 41-59; col 4, lines 5-15 and 65-67; col 5, lines 1-5).

Pandian et al does not disclose combining the emulsion with a second starch.

The disclosure of Pardikes is used as above.

The art of Pandian et al, Pardikes and the instant invention is analogous as pertaining to making sizing compositions for paper. It would have been obvious to one of ordinary skill in the art to emulsify a first starch component and ASA and to combine the emulsion with a second starch component in the process of Pandian et al in view of Pardikes to obtain the advantages disclosed by Pardikes.

Claims 43 and 44: The starch:ASA ratios disclosed by Pardikes overlay the claimed ratios.

Claim 45: Pardikes discloses that a starch and water solution of 3-4% is used commercially (col 2, lines 48-49). Using such typical concentration would have been obvious to one of ordinary skill in the art as a functionally equivalent option.

Claims 16, 35, 36, 38 and 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai et al (5595631) in view of Pardikes.

Claims 16, 35, 36 and 38: Tsai et al discloses a method of making a paper sizing composition comprising emulsifying water, ASA and a cationic non-degraded starch (first starch component). Suitable starches are potato starch, corn starch, wheat starch, tapioca starch, etc. The starches can be modified by hydroxyalkylation or acetylation thus are the claimed modification products. The composition has improved sizing



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performance, thus the ratio of starch:ASA is sufficiently high to enable the composition to impart useful sizing properties to the paper or, at least, such ratio and sizing properties would have been obvious to one of ordinary skill (Abs; col 2, lines 23-43; col 3, lines 16-42; col 4, lines 21-53; col 5, line 57 to col 6, line 4; col 7, line 61 to col 8, line 16).

Tsai et al does not disclose combining the emulsion with a second starch.

The disclosure of Pardikes is used as above.

The art of Tsai et al, Pardikes and the instant invention is analogous as pertaining to making sizing compositions for paper. It would have been obvious to one of ordinary skill in the art to emulsify a first starch component and ASA and to combine the emulsion with a second starch component in the process of Tsai et al in view of Pardikes to obtain the advantages disclosed by Pardikes.

Claims 43 and 44: Tsai et al discloses a ratio of from about 0.1 to about 10 parts starch to 1 part ASA (col 6, lines 24-27). The starch:ASA ratios disclosed by Tsai et al and by Pardikes overlay the claimed ratios.

Claim 45: Pardikes discloses that a starch and water solution of 3-4% is used commercially (col 2, lines 48-49). Using such typical concentration would have been obvious to one of ordinary skill in the art as a functionally equivalent option.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Duplaise et al, Pandian et al or Tsai et al in view of Pardikes and further in view of Maher (4769081).

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The disclosures of Duplaise et al, Pandian et al or Tsai et al are used as above. Duplaise et al, Pandian et al and Tsai et al do not teach heat treating the starch to modify it.

Maher teaches that starches (corn starch, potato starch, wheat starch, tapioca starch, etc.), unmodified or chemically modified by known methods (esterification, etherification, oxidation, etc.), that are used in food and industrial applications are often dispersed or dissolved in an aqueous medium. Non-gelatinized, cold-water insoluble, granular starches used in such applications are typically dispersed in an aqueous medium and cooked (heat treated) to gelatinize and solubilize the granular starch material (col 1, lines 23-33; col 2, lines 27-33).

The art of Duplaise et al, Pandian et al, Tsai et al, Maher and the instant invention is analogous as pertaining to the use of aqueous compositions of starches. It would have been obvious to one of ordinary skill in the art to cook the starch in the process of Duplaise et al, Pandian et al or Tsai et al in view of Pardikes and further in view of Maher as a typical procedure known in the art to make the starch water soluble.

### ***Allowable Subject Matter***

Claims 41 and 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art teaches both high and low pressure emulsification of starch/ASA mixtures. The prior art fails to disclose the claimed inlet and outlet temperatures for the

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emulsification. Duplaise et al discloses the claimed pressures in Examples 4-5 (col 9), but fails to disclose the temperature. Example 15 (col 13) discloses a temperature for the emulsification (80-110 °F) that is significantly lower than the claimed range.

Pardikes discloses much higher pressures than the claimed range. Mazzarella et al (4040900) teaches that temperatures higher than room temperature are to be avoided when emulsifying ASA due to hydrolysis of the anhydride (col 5, lines 61-65). One of ordinary skill in the art would not find it obvious to use the claimed temperature range.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS CORDRAY whose telephone number is (571)272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dennis Cordray/  
Examiner, Art Unit 1791

/Eric Hug/  
Primary Examiner, Art Unit 1791